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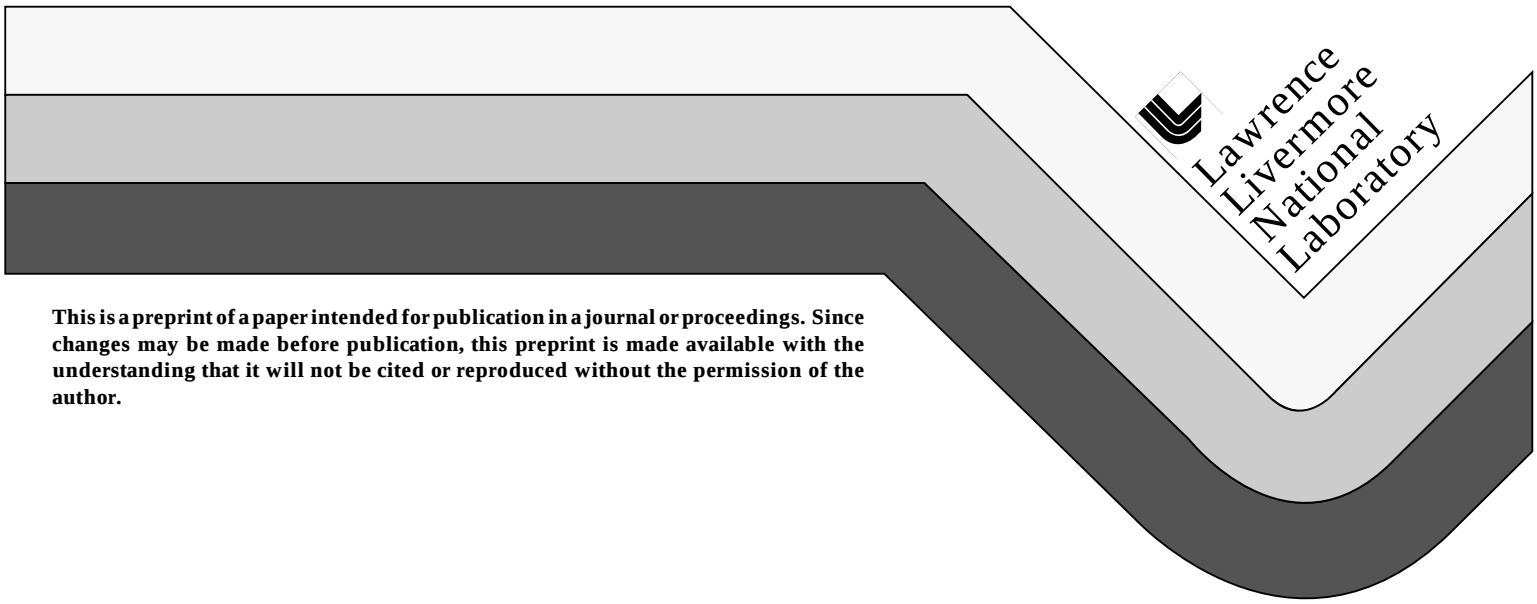

The Value of Assessments in Lawrence Livermore National Laboratory's Waste Certification Programs

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Abstract

This paper will discuss the value of assessments in Lawrence Livermore National Laboratory's Waste Certification Programs by:

- introducing the organization and purpose of the LLNL Waste Certification Programs for transuranic, low-level, and hazardous waste,
- examining the differences in internal assessment / audit requirements for these programs,
- discussing the values and costs of assessments in a waste certification program,
- presenting practical recommendations to maximize the value of your assessment programs, and
- presenting improvements in LLNL's waste certification processes that resulted from assessments.

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INTRODUCTION

Lawrence Livermore National Laboratory (LLNL) has developed separate Waste Program Certification and QA Programs (WCPs) for low-level (and low-level mixed) (LLW), transuranic (and transuranic mixed) (TW), and hazardous waste (HW) that must comply with specific waste acceptance criteria (WAC) and quality assurance (QA) requirements. Each WCP requires that independent and self-assessment programs be developed and implemented. However, value achieved from these assessment programs depends on many factors. Satisfying customer and performance expectations is extremely difficult in an environment with numerous stakeholders and changing regulatory, fiscal, organizational, and programmatic constraints.

ORGANIZATION AND OBJECTIVES OF THE LLNL WASTE CERTIFICATION PROGRAMS FOR LOW-LEVEL, TRANSURANIC, AND HAZARDOUS WASTE

LLNL is a multi-program laboratory operated by the University of California for the Department of Energy (DOE). Major DOE programs conducted by the Laboratory include weapons activities, inertial confinement fusion, arms verification and control technology, magnetic fusion energy, commercial nuclear waste disposal technology, laser isotope separation technology, biomedical research, environmental research, fossil energy, energy storage systems, and basic energy sciences (M-078-95, 1994). Numerous LLNL stakeholders and waste generators from various facilities and organizations implement the 3 WCPs for LLW, TW, and HW. Figure 1 describes the LLNL management organization and the location of the waste generators. The WCPs and waste certification approval processeses are summarized below:

Low-level Waste Program Certification and QA Program

LLNL generates approximately 25 LLW streams originating from facility-specific or non-facility-specific sources. The LLW Program Certification and QA Plan describes how LLWs are certified for shipments to the Nevada Test Site (NTS) or other storage or disposal facilities deemed appropriate by the LLNL Waste Certification Official (WCO) as required by NVO-325, Nevada Test Site Defense Waste Acceptance Criteria, Certification, and Transfer Requirements. The WCO submits an application including the WCP and implementing procedures to receive authorization to certify each waste stream. NTS representatives audit compliance with the WCP prior to granting authorization to certify LLW for shipment to NTS.

Transuranic Waste Program Certification and QA Program

Defense programs at LLNL generate from 10 to 20 m^3 of TW per year. The TW Program Certification and QA Plan describes how TWs are certified for shipments to the Waste Isolation Plant (WIPP) as required by the WAC in WIPP/DOE-069, *TRU Waste Acceptance Criteria for the Waste Isolation Pilot Plant*, and QA requirements in Section 830.120 in Title 10 of the Code of Federal Regulations (i.e., 10 CFR 830.120).

Members of the National TW Program Office audit compliance with the WCP prior to authorizing LLNL to certify TW for shipment to WIPP.

Hazardous Waste Certification and QA Program

LLNL's Waste Certification and QA Program for hazardous waste is described in UCRL-AR-109662, *Criteria and Procedures for the Certification of Nonradioactive Hazardous Waste*. This manual was developed by LLNL in response to the moratorium on the shipment of potentially radioactive hazardous waste the DOE imposed in May 1991. It is a compilation of LLNL documents that support certification of hazardous waste as having no added radioactivity before off-site shipment is permitted. The QA and assessment programs that comply with DOE Order 5700.6C, *Quality Assurance*, for LLNL organizations that support HW certification are included in this document. DOE approval of the document was required to lift the moratorium. Major revisions to the document require DOE concurrence. At its discretion, the DOE audits LLNL's compliance to these requirements. LLNL organizations self-assess and independently assess compliance with applicable sections of the manual as required by DOE Order 5700.6C.

DIFFERENCES IN ASSESSMENT REQUIREMENTS FOR LLNL'S WASTE CERTIFICATION PROGRAMS

Assessment programs for LLW are based on QA requirements for nuclear facilities. The assessment requirements for HW are based on DOE Order 5700.6C which allows more flexibility. For example, self- and independent assessment procedures for LLW and TW WCPs are required to include specific provisions for compliance-based audits, audit schedules, plans, performance, and follow-up. On the other hand, those for HW operations may be designed and applied to an extent based on their cost, complexity, environmental and safety risks. Assessment programs supporting HW operations typically include more innovative and cost-effective audit methods. Best management practices and internal performance measures may be added to the compliance-based elements in audit checklists. Audit organizations may work more collaboratively to elimination redundant activities to support efficient and effective allocation of resources. Audit personnel may also self-assess their own performance to continually improve the audit process.

THE VALUES AND COSTS OF ASSESSMENTS

The role of assessments to obtain and maintain authorization to certify and ship LLW, TW, and HW has been discussed. Unsatisfactory assessment programs may result in denial or removal of your authorization to certify and ultimately ship waste. Waste-generating operations may be significantly impacted if waste storage capacities for LLW and TW are limited.

It is important that assessments validly represent the status of your WCP. Failure of the assessment program to identify deficiencies could also result in increased monetary penalties by external regulatory agencies. In addition, under NVO-325, the waste generator is charged for any special handling or packaging of waste required to decontaminate, repair, or correct deficiencies related to waste containers received at NTS. Repetitive findings identified by NTS may result in suspension of authorization to ship waste. These may also affect the auditors' levels of confidence in management of the WCPs. Auditors may increase their level of scrutiny which could add significantly to assessment and waste certification costs.

However, assessments are also excellent tools to manage, plan, and improve waste certification activities. They may be used to verify the extent that established programmatic, environmental, regulatory, safety and management objectives and customer expectations are met. They are also used by management to allocate resources for corrective action plans. Outside auditors may view assessment programs as objective measures of management performance.

Development and implementation of effective assessment programs require an extensive commitment of funds, time, money, and personnel. Implementing procedures and auditor qualifications must be updated, improved, and maintained. Assessments must be planned and regularly scheduled. Auditors and auditees allocate significant time and resources to audit performance and correction and prevention of quality problems.

Clearly, assessments should be designed so that their benefits outweigh the costs. However, the assessment program and supporting personnel should also be able to adapt easily to changes in performance criteria. For example, new DOE regulatory and business philosophies may have an impact on customer expectations. Work processes may change in response. Ultimately, fiscal, personnel, management and programmatic resources may have to be reallocated.

PRACTICAL RECOMMENDATIONS TO DEVELOP AND IMPLEMENT AN EFFECTIVE ASSESSMENT PROGRAM FOR WASTE CERTIFICATION

The success of your assessment program depends on its effective management, implementation, and assessment. First, your assessment program should be managed carefully and strategically. A project plan that defines the quality management controls for your assessment program should be developed and documented. Internal and external customers and stakeholders including regulators and auditees need to be identified. WCP management needs to work collaboratively with internal and external customers to define expectations and safety, fiscal, regulatory, and other constraints. Applicable elements should be negotiated to the agreement of all parties. The resulting performance criteria need to be integrated in the project plan and incorporated into the applicable procedures. The project plan and procedures should be updated as performance (i.e., customer) expectations and constraints change.

Audit teams should also be selected carefully. Effective auditting requires proficiency in not only the technical aspects of the WCPs but also analytical, communications, auditting, negotiating, interviewing, organizational and quality management skills. Use of teams with a versatile mix of qualifications led by experienced quality professionals will facilitate achievement of audit objectives (Martinez, 1992).

Audit teams and the audit process may also be improved by including personnel knowledgeable in WCP processes from various internal organizations and from other DOE facilities as technical experts or observers on your audit team. QA auditors gain valuable insights from personnel who are familiar with different work processes and the guest auditors gain information in the audit process.

Effective collaborations and communications between waste certification and assessment personnel contribute to the value of your assessment program. These support coordination of audit activities and resolution of deficiencies. Status of waste activities for new and existing waste streams should be consistently communicated to audit personnel for audit planning and scheduling. Self-assessment and independent assessment personnel should establish a strategic blend of horizontal and vertical slice auditting techniques to accomplish audit objectives. Including independent and self-assessment groups in the WCP and procedures review process may facilitate the program review portion of the assessment process and promote communications. Training in team-building, listening and negotiating skills should support these efforts.

The implementation of innovative but practical recommendations may complement a compliance-based assessment program. Include proven and well-supported best management practices in the assessment checklist to evaluate the impact of management activities and organizational dynamics on achievement of performance objectives. Implement controls to self-assess your audit performance. Trend findings to evaluate the effectiveness of corrective actions to prevent recurrence. Use customer surveys or questionnaires to measure customer satisfaction. A good source of information to develop these is *Measuring Customer Satisfaction - Development and Use of Questionnaires* by Bob E. Hayes. Incorporation of customers' assessment expectations (i.e., from the Assessment Program Project Plan) in your audit checklists may also be useful.

IMPROVEMENTS IN LLNL'S WASTE CERTIFICATION PROCESSES THAT RESULTED FROM ASSESSMENTS

Assessments hold a key role in the success of LLNL 's Waste Certification Programs for LLW, TW and HW. Here are a few of the major benefits that resulted from the WCP's assessment program.

LLNL received authorization to certify and ship 23 LLW streams and is in the early stages of receiving approval for 2 new waste streams. LLNL's assessment program for its waste streams has resulted in increased confidence in LLNL's ability to effectively manage waste operations. This has facilitated the waste certification process for new waste streams.

Audits of contract analytical laboratories and waste container suppliers for the LLW and TW WCPs are coordinated with other organizations to share in available resources.

Implementing procedures for the LLW and TW WCPs have been integrated to eliminate duplication.

Updates to training information are coordinated with revisions to the WCPs to assure maintenance of personnel proficiency.

Roles and responsibilities of waste certification and supporting personnel were clarified.

Self-assessment activities have increased.

Efficency in allocation of resources for the WCPs has improved.

CONCLUSION

The value and costs of assessments in waste certification programs can not be understated. Effective compliance-based programs ensure your ability to certify and ship waste and prevent monetary penalties. But assessment programs also require extensive commitment of funds, time, and personnel. They must also be able to adapt quickly to changing customer expectations and performance constraints. Compliance -based programs can be enhanced to maximize use of your assessment resources. The use of strategic planning, collaborative work efforts, multi-skilled assessment and waste certification personnel, and innovative quality improvement methods will improve versatility, maximize value, and minimize costs of your assessment program.

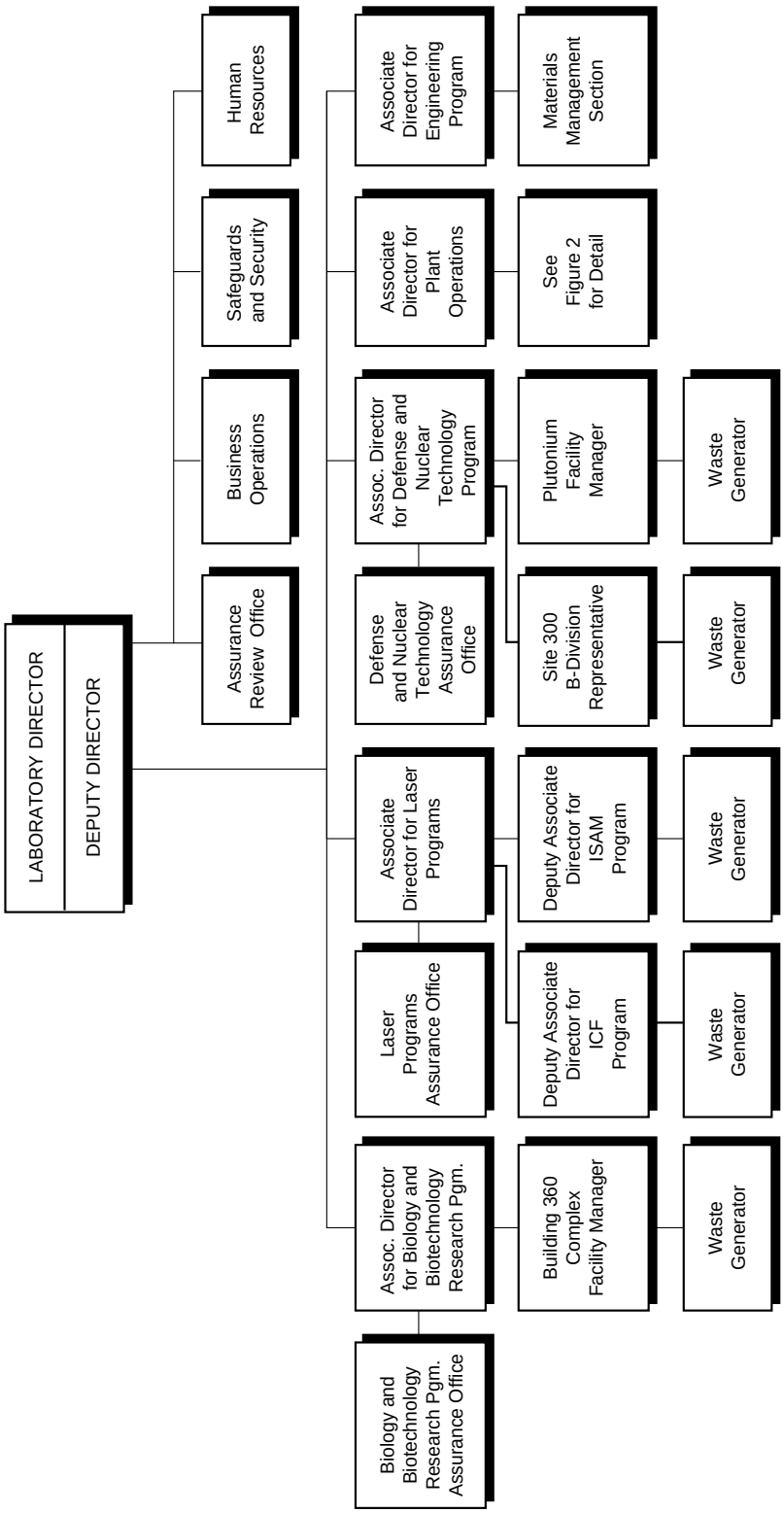

Figure 1. LLNL Management Organization and Waste Generators

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